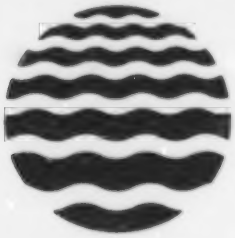
STOPPING WATER POLLUTION AT ITS SOURCE



MISA

Municipal/Industrial Strategy for Abatement

ISSUES RESOLUTION PROCESS

FINAL REPORT

SUMMARY

September 1991

Ontario

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PREFACE

The Ontario Ministry of the Environment initiated the Municipal-Industrial Strategy for Abatement (MISA) Program in 1986. MISA was originally designed as a regulatory program to reduce water pollution from both industrial and municipal dischargers; the ultimate goal was to virtually eliminate persistent (long-lasting) toxic contaminants from all discharges into Ontario's waterways.

Initially, technology-based effluent limits were to be imposed on each discharger as a minimum pollution control requirement. In addition, more stringent effluent limits were to be superimposed on dischargers on a site-specific basis to protect sensitive waterbodies receiving the discharge.

Early in 1990, special working groups called Issue Resolution Committees (IRCs) were formed that included representatives of the Ministry of the Environment, industry and municipalities; Environment Canada and the MISA Advisory Committee were observers. These committees were asked to review proposals on how to develop effluent limits. The general development process outlined in the original White Paper of 1986 remained; the IRC proposals were designed to provide more detailed guidelines.

In June 1990, the IRCs completed their review and submitted their reports to the ministry. Interested parties, including environmental groups and Remedial Action Plan Public Advisory Committees, were then asked by the minister to examine the IRC proposals and offer comments and suggestions.

As a result, the ministry received 25 submissions, representing 44 groups and individuals. Their comments and concerns were carefully assessed, along with the original recommendations of the IRCs, during the ministry's decision-making process.

This document presents a summary[1] of the MISA issues resolution process, the public comments received and the ministry's decisions on the procedures and criteria that will guide effluent limits regulation development.

This summary document is comprised of four sections:

- Section I presents background information on MISA, including activities to date, and contains a description of the effluent limits development process.

- Section II provides details about the issues resolution process as well as the issues which the IRCs addressed in their reports.

- Section III presents a summary of the public comments received on the IRC documents.

- Section IV presents the ministry's standardized procedures and criteria that will be used to develop effluent limits for the industrial sectors.

(1) *For complete details on the Issues Resolution Process, refer to the document titled "Issues Resolution Process -- Final Report" (Ontario Ministry of the Environment, 1991).*

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1 INTRODUCTION

Background

The ultimate goal of MISA is the virtual elimination of toxic contaminants from all discharges into Ontario's waterways.

The process to develop technology-based effluent limits, as described in the MISA White Paper of 1986, involved two phases. In the first phase, effluent monitoring regulations were developed which required dischargers to monitor their effluents at their source-point at regular intervals, using specific sampling, analytical, quality control and quality assurance protocols and procedures. (monitoring was completed in August 1991)

The second stage, as originally envisioned, involved the development and implementation of effluent limits for each of the industrial and municipal sectors, on a sector-by-sector basis, using data collected under the monitoring regulations. The limits were to be based on the "best available technology economically achievable", BAT(EA).

The MISA program currently includes polluters that discharge directly into Ontario's waterways, including industrial direct dischargers and municipal sewage treatment works, as outlined below:

- Industrial direct dischargers in the following sectors:
  - Petroleum Refining
  - Organic Chemicals Manufacturing
  - Iron and Steel
  - Mining
  - Pulp and Paper
  - Inorganic Chemicals
  - Metal Casting
  - Electric Power Generation
  - Industrial Minerals

- Municipal Sewage Treatment Works

In addition, approximately 12,000 industries currently discharging into municipal sewer systems will be regulated under MISA through the Sewer Use Control Program.

To date, monitoring regulations for all nine industrial sectors have become law; monitoring activities have been completed. Now, the ministry is ready for the second phase: developing effluent limits regulations for the industrial sectors.

In August 1989, approval was given to develop the MISA Municipal Program. This includes regulations for sewage treatment plants (STPs) and the Sewer Use Control Program.

Part of the process to develop STP regulations involves estimating costs for municipalities to comply with various regulation requirements -- for example, no acute (short-term) toxicity in effluents. Discussions with the Ministry of Municipal Affairs have indicated that at least half of Ontario's municipalities will have difficulty to meet the costs. The Ministries of the Environment and Municipal Affairs are continuing to meet to develop strategies to financially assist municipalities.

Earlier, in September 1988, the ministry had published a discussion paper, "Controlling Industrial Discharges to Sewers", outlining the ministry's proposals for reducing industrial contaminants entering receiving waters through municipal sewerage systems.

As a follow-up, many activities have been initiated to prepare stakeholders for the program, including demonstration projects in five municipalities (to establish municipal enforcement practices), and training courses covering all aspects of sewer use by-law enforcement.

As well, the ministry is assisting a number of municipalities to adopt and implement the 1988-revised model sewer user by-law. Enforcing of the by-law involves these municipalities in many of the functions that will be required under a sewer use control regulation.

The Effluent Limits Development Process

Regulations specifying effluent limits will be imposed on each of the nine industrial sectors and the municipal sector. These regulations will be developed with recommendations from Joint Technical Committees (JTCs) specific to each industrial sector, and include representatives of the ministry, industry, and municipalities (Environment Canada and members of the MISA Advisory Committee also participated at the JTC meetings as observers.)

When the draft effluent limits regulation (and the development document for the draft regulation, which contains the technical rationale supporting the regulation requirements) has been completed for each sector, it is submitted by the JTC to the Minister of the Environment.

The Minister then requests that the MISA Advisory Committee review the draft regulation. After incorporating changes suggested by the committee, the Minister will release the draft regulation (along with the supporting documents) to the public for review and critique.

This process allows all affected stakeholders -- particularly the public -- an opportunity to comment on the regulation before it becomes law.

The process for developing effluent limits was set out in the 1986 MISA White Paper. Each step in the process requires the application of scientifically-sound and defensible procedures and criteria. In most cases, these procedures and criteria have already been developed in other jurisdictions. However, the JTCs need further direction as to the specific -- the standard -- approach to be taken in developing effluent limits specifically for Ontario, and that can be consistently applied to all sectors.

The issues resolution process was undertaken to provide that direction.

The process has established standardized procedures and criteria for each step in the effluent limits development process. The standardization of procedures and criteria ensures that key concepts are not open to interpretation during the limit-setting exercise. More importantly, the standardized procedures and criteria give clear and specific guidelines to the JTCs as they draft Effluent Limits Regulation requirements.

The consistency inherent in the use of standardized procedures and criteria also assures the development of equitable effluent limits across all sectors.

II THE ISSUES RESOLUTION PROCESS

The Issues

Issues -- those key activities, definitions and concepts that will be encountered by the JTCs in each step of the Effluent Limits Regulation development process -- are listed below, along with the corresponding step in the development process.

The Issues

Quality Assurance and Quality Control	*Step 1*
Monitoring Data Analysis	*Step 2*
Selection of Parameters for Limits	*Step 3*
Virtual Elimination	*Step 4*
Best Available Technology	*Step 5*
Economic Achievability	*Step 6*
Limit Setting and Form of Limits	*Step 7*
Net Loadings	*Step 8*
Toxicity	*Step 9*
Flow Measurement Accuracy	*Step 10*
Compliance	*Step 11*
Monitoring For Assessment	*Step 12*
Stormwater	*Step 13*
By-passes	*Step 14*
Reporting to the Public	*Step 15*

The Process

To develop standard procedures and criteria, the ministry initially reviewed each step in the Effluent Limits Regulation development process. The ministry then identified an alternative, or option, from the procedures and criteria currently available, for each step.

The selected alternative had to fulfil the following conditions:

- it maintains and reinforces MISA principles;
- it is scientifically sound;
- it upholds international agreements and commitments.

The Issue Resolution Committees released draft reports, one report on each issue. The reports presented the agreed-upon alternatives as IRC recommendations. In areas where agreement was not reached, the concerns and other options of participants were recorded in the IRC reports.

The draft IRC reports were submitted to the ministry in June 1990. Before deciding on the IRCs' recommendations, the Minister invited other interested parties to review and comment on the reports by October 1990.

The following section contains an overview of comments from that public review.

III PUBLIC REVIEW COMMENTS

Overview of Comments Received

Twenty-five individual submissions were received on the Issue Resolution Committee Reports. Included in the submissions were those from stakeholder groups that participated on the IRCs, namely, the MISA Advisory Committee, Environment Canada, municipalities, sector companies and industry associations.

Submissions were also received from private citizens, industrial organizations and environmental interest groups All submission authors are listed on page 7.

Nature of Comments

The types of comments received were classified as:

- comments directly related to specific issues, or
- critiques of the MISA program.

Comments directly related to specific issues are not reproduced here. However, Section IV presents the standard procedures and criteria that the ministry will use to develop Effluent Limits Regulations. These standard procedures and criteria were adopted based on the recommendations in the draft IRC reports and on the public comments received.

Summaries of those public comments, along with the ministry's responses, are presented in the Appendix of the Issues Resolution Process -- Final Report (Ontario Ministry of the Environment, 1991).

Most of the comments the ministry received were critiques of the overall MISA program -- of its principles and future direction. Key concepts contained in these comments are summarized on page 9. These comments prompted the ministry to review and strengthen the policies upon which MISA was based.

Submission Authors

Algoma Manitoulin Nuclear Awareness[1]
Bay of Quinte RAP PAC[2]
Canadian Auto Workers Local 444/Environment Committee[1]
Canadian Environmental Law Association[3]
Canadian Institute for Environmental Law and Policy[1]
Canadian Petroleum Products Institute
Citizens Network on Waste Management[1]
Cornwall Public Advisory Committee[1]
Detroit River RAP PAC
Michael Dickman, Brock University
W.R. Drynan, City of Windsor
H.H. Eisler, Stelco Inc.
Environment Canada
Federation of Ontario Naturalists[1]
Great Lakes United[1]
Greenpeace[3]
Hamilton Harbour RAP Team
Jackfish Bay RAP PAC
Jackfish Environmental Protection Association[1]
Little Cataraqui Environmental Association[1]
Metro Toronto and Region RAP PAC
MISA Advisory Committee
Municipal Engineers Association
Multi-Sector Industry Group
Nipigon Bay RAP PAC
North Shore Steelhead Association[1]
Northwatch[1]
Ontario Federation of Labour[1]
Ontario Mining Association
Ontario Public Health Association[1]
Ontario Toxic Waste Research Coalition[1]
Pollution Probe[1]
Quinte Environmental Resources Alliance[1]
St. Clair River RAP PAC
St. Clair River International Citizen's Network[1]

St. Lawrence River RAP PAC
Severn Sound RAP PAC
J. Skelton, Thunder Bay RAP PAC[3]
Spanish Harbour RAP PAC
Thunder Bay RAP PAC
Wallaceburg Clean Water Committee[1]
Windsor and District Clean Water Alliance[3]
Windsor and District Labour Council/Environment Committee[1]
Windsor-Essex Greening Project[1]

[1] *Joint Submission*
[2] *Remedial Action Plan Public Advisory Committee*
[3] *Represented on Joint Submission, but also provided individual submission*

Key Concepts in Program Critique Comments

Three key concepts emerged as the dominant principles upon which the MISA program should be based:

- zero discharge of persistent, toxic substances
- pollution prevention
- multi-media (water, air, land) approach to environmental management.

Zero Discharge of Persistent, Toxic Substances

Many concerns were raised about the original MISA process for achieving "virtual elimination" of persistent toxic waste discharge; that is, gradual reduction in the discharge of some persistent toxic pollutants until eventually, at some future time, there is no toxic discharge.

Many submissions proposed that, to be truly effective in achieving virtual elimination -- and to meet our commitments under the Canada-United States Great Lakes Water Quality Agreement (GLWQA) -- MISA must encompass the elimination of all deliberate inputs of certain toxic chemicals by stopping the manufacture, use and discharge of these specific chemicals.

As stated in one submission... *"it is absolutely essential that any new legislation demands complete elimination of toxic substances from our waterways. Only through a zero discharge approach is this likely to be achieved"*. Mandating the elimination of certain chemicals, using bans and phase-outs over specific timeframes, was the suggested method for implementing zero discharge.

Pollution Prevention

"Virtual elimination", as presented in the GLWQA, refers to a preventive approach to pollution control. Many submissions stated that for MISA to be consistent with the terms of the agreement, the program must emphasize pollution prevention, rather than end-of-pipe treatment. In this way, MISA would shift away from being a technology-driven program, toward an approach that encourages dischargers to find alternative production processes and chemicals -- and thereby preventing the formation and discharge of toxic chemicals at source.

It was noted that the pollution prevention approach would ultimately result in cost avoidance for companies. Costly end-of-pipe control systems would not be needed, nor would costly remedial clean up actions have to be undertaken.

Multi-Media Approach to Environmental Management

The third important concept emerging from the public review, related to MISA, was the need to take a multi-media approach to environmental management.

This concept was expressed in two contexts. In the first context, many comments were received urging greater integration of provincial environmental initiatives. In the second context, people expressed concern about the need for laws to protect against cross-media transfer of pollution (that is, pollution in one medium, such as water, moving on to affect another medium, such as land).

To address these concerns, many suggested that MISA be based on a multi-media approach to environmental protection: that dischargers account for and control pollution from all sources and for all media by meeting legislated reductions of toxic substances.

IV STANDARD PROCEDURES AND CRITERIA

Introduction

This section describes the standard procedures and criteria which the ministry will use to develop MISA Effluent Limits Regulations requirements.

The rationale supporting the standard approach to be used for each step in developing regulation requirements is outlined in the complete Issues Resolution Process -- Final Report document (Ontario Ministry of the Environment, 1991).

Standard Procedures and Criteria

Quality Assurance and Quality Control

Quality assurances and quality control (QA/QC) are ways to prove that the data collected, and the results of analysis of that data, are valid.

The procedures and criteria described in the "Guidance Document for the Assessment and Interpretation of Analytical and Quality Control Data" will be applied to assess data quality.

The procedure and criteria in the report enable examination of elements such as data consistency, trends, discontinuities, sources of data variability and overall data comparability. It also makes it possible to identify the potential for under- or over-estimation of resultant values, and for false positive or false negative decisions for specific analytes (samples).

In conducting the QA/QC analysis, effluent monitoring data can be evaluated by graphical and statistical techniques; these identify patterns and anomalies. Effluent data can also be reviewed across a sector to establish overall data variability and consistency.

Effluent data deemed satisfactory, based on an evaluation of associated QA/QC data, can be used to establish effluent limits. Effluent data deemed to be less than satisfactory, based on an evaluation of associated QA/QC data, will not be used to set effluent limits. However, the data will remain in the database and will be publicly reported.

Information about laboratory testing can be obtained from the ministry. The Canadian Association of Environmental Analysis Laboratories is finalizing a laboratory certification program, which will be helpful for people seeking competent laboratory testing.

The results of the QA/QC analysis for each sector will be published in the Development Document for the Effluent Limits Regulation for that sector.

Monitoring Data Analysis

The monitoring data used to develop effluent limits will be analyzed according to the standard approach presented in Issues Resolution Process -- Final Report (Ontario Ministry of the Environment, 1991).

All monitoring data will be analyzed by the JTCs on a plant-by-plant basis. Tests will be applied to the monitoring data to establish distribution, presence of anomalies, extent of autocorrelation among parameters, mean (average) concentrations and loadings and variability.

If data are identified as outliers (anomalies that don't fit into the rest of the data), then that data will not be used to calculate limits, if it can be conclusively proven to the ministry, the JTC and the MISA Advisory Committee that the data represent analytical errors and not normal operating conditions. Although anomalies will not be used for setting limits, they will remain in the database.

The results of the monitoring data analysis for each sector will be published in the Development Document for the Effluent Limits Regulation for that sector, along with all other technical rationale supporting the regulation requirements.

Selection of Parameters for Limits

The selection process to produce a list of parameters (pollutants likely or possibly to be found, based on previous-collected information) for the purpose of setting limits will be applied to parameters measured under the MISA Effluent Monitoring Regulations. All analytical data collected under MISA will be analyzed by stream (i.e. source) type.

All persistent (long-lasting) toxic contaminants with at least 10 per cent of the samples (at a 95 per cent confidence level) greater than the Regulation Method Detection Limit (RMDL,

the detectable amounts of a contaminant, as set out using methods described by regulation) for that contaminant will be included in the list of parameters.

All non-persistent toxic, conventional and non-conventional pollutants with at least 10 per cent of the samples (at a 95 per cent confidence level) greater than the Provincial Water Quality Objective for that pollutant, will be included in the list of parameters.

Parameters of environmental significance, which are not selected according to the two criteria above, can be added to the list of selected parameters by the ministry or the JTC.

Virtual Elimination

The ministry will adopt the working definition of virtual elimination as described by the International Joint Commission Task Force on Virtual Elimination.

The task force definition of "virtual elimination":

"... an overall strategy, focusing on preventative and remedial approaches, to achieve the GLWQA goal of restoring and maintaining ecosystem health....
... 'virtual' because it is not practical to completely remove all persistent toxics that have been previously released...
...includes application of the 'zero discharge' as one method to prevent releases of certain substances to the ecosystem."

The task force defines "persistent toxics" as:
"...all toxic substances with a half-life greater that eight (8) weeks...that cause death, disease, behaviourial abnormalities, cancer, genetic mutations, physiological or reproductive malfunctions, or physical deformities in any organism or its offspring."

"Zero discharge" as defined by the task force is:
"...no inputs of specific persistent toxic substances into the ecosystem."

The MISA goal for virtual elimination of persistent toxic contaminants from discharges to Ontario's waterways will be achieved by imposing pollution prevention and control strategies. These strategies include:
- zero discharge of specific, water-based persistent toxic substances;

- reduction of persistent toxic substances which are not slated for zero discharge (and which do not have effluent limits);
- effluent limits for a list of sector-specific parameters;
- no acute (short-term) toxicity in effluents.

As a first step toward achieving the goal of virtual elimination, the ministry will release regulations for each sector specifying effluent limits, the requirement that all effluents must be non-acutely lethal and the list of water-based persistent toxic substances that must be eliminated from discharges, along with the timetable for elimination.

Draft regulations will be released for public review by 1992, with regulations for all industrial sectors to be in place by the summer of 1993.

Best Available Technology

The Joint Technical Committees have identified the best available technology (BAT) for each industrial sector. Best available technology can include, in order of preference:
(1) changes in production processes
(2) chemical substitution
(3) in-plant controls
(4) best management practices
(5) water conservation
(6) effluent treatment technologies
(7) energy conservation.

A "best available technology" would only be considered such by the JTC if it:
- can be utilized in a similar application at full-, bench-, or pilot-scale;
- can be retrofitted into existing facilities; and
- design/sizing and costing information is available (or, for bench- and pilot-scale technologies, sufficient information should be available to develop design/sizing and costing criteria).

When evaluating BAT options, the JTCs considered:
- how the technology minimizes the unabated transfer of substances to other media (air or land).
- how the technology increases reduction, re-use and recycling of solid waste and toxic materials, and
- to what extent the technology promotes water conservation

To assess the economic implications (the financial burden of using the BAT, and the benefits) at least five BAT options should be put forward, including:

- the best technology currently in use anywhere in the world, where conditions are most similar to Ontario;
- the U.S. EPA BAT for the sector;
- the best technology currently in use in Ontario;
- any technology that advances the sector or sub-sector towards the MISA goal; and
- a "zero discharge of water" BAT option.

While a BAT will be the basis for establishing effluent limits, dischargers are under no obligation to use that technology.

Economic Achievability

Economic assessments will be used to estimate the financial and economic consequences of imposing limits based on BAT options on dischargers within a sector.

Cost estimates will be generated on a plant-by-plant basis for each sector. Financial and economic assessments will be carried out at an appropriate level (at plant or firm level) in each sector, subject to the availability of data. Abatement cost functions will be developed for different BAT options in order to show the relationship between different levels of contaminant removal and the minimum cost of achieving them. Private benefits (the benefits to the discharger) will be enumerated and valued so as to determine the net costs of each BAT option that is analyzed. Annualized costs or discounted present values will be used to permit comparison of capital costs or payments at different times.

Information on market conditions of the various industrial sectors will be analyzed to indicate the extent to which firms must absorb the extra net costs as reductions in net profit and returns. Or, they will be able to pass all or part of their net incremental compliance costs onto their customers as higher prices, or to suppliers through price concessions.

The effects on international competitiveness, as measured by sector norms, will also be considered. Economic and financial consequences will be assessed for each plant (if data are available), individual firms, industrial sectors and the provincial economy as a whole. The disparities between large and small business, and between regions within the province, will also

be examined. Where possible, analyses will explicitly show distribution of various effects on the relevant segments and groups in Ontario.

While there are no widely-agreed-upon threshold values upon which to judge the significance of economic or financial impacts, three ranges of outcomes can be provided:
(1) adverse impacts quite unlikely;
(2) adverse impacts quite likely; and
(3) impacts uncertain.

The economics associated with achieving an effluent level will be one consideration of many in reaching a decision on effluent limits.

Public benefits -- benefits to the public at large -- in the context of formal cost-benefit analysis, will not form part of the basis for JTC decisions during the development of Effluent Limits Regulations for each sector.

Limit Setting and Form of Limits

Each sector will have two sets of limits. The first set will be monthly average limits; these will be based on measurements taken daily, or taken one day per week. Each daily or weekly measurement will also have a daily maximum limit. The second set will be daily maximum limits, based on daily measurements taken once each quarter.

Limits can be in the form of concentration (such as parts of contaminant per million), loading (discharge per day), or production-based loading (discharge required to produce a unit of the product). The type of limit chosen will depend on the correlation of variables such as flow, loading and production. All sectors will have concentration limits.

Where water conservation is practised, a daily maximum concentration limit need not be set, provided that the original loading limit (prior to water conservation) remains unchanged, or is further reduced, and that the effluent is non-toxic. However, the JTC can recommend both loading limits and daily maximum concentration limits.

Limits will be set on parameters for which BAT treatment exists. Limits can also be set on other parameters which pose a significant threat to human health and the environment.

For each parameter, limits will be based on the product of long-term average and a variability factor. The daily maximum, and monthly average, effluent limits will be calculated as the product of the long-term average pollutant concentrations and the daily variability and monthly average variability factors, respectively.

The daily variability factor will be based on the 99th percentile concentration from the distribution of daily samples; the monthly variability factor will be based on the 95th percentile concentration from the distribution of monthly average samples.

To address concerns about potential statistical non-compliance (occasions when the statistics indicate a violation) associated with these limits, the ministry's enforcement policy will provide clear guidelines for the handling of so-called statistical violations.

Net Loadings

Contaminants found in effluents may have already been present in the intake water. Net loading is the difference between the contaminants discharged, and the discharge that was already present. Net loading recognizes the contribution to total effluent loading that can be attributed to intake water.

Net loadings will not be used in the development of effluent limits. The regulations subject all similar contaminants to the same treatment regardless of source. Therefore, there is no practical way to separately quantify the impact of intake contaminants on the final performance data.

Net loadings will not be used to assess compliance for process, combined, or stormwater effluents. However, at the request of the discharger, the ministry will consider publishing intake water data alongside effluent data. The intake water data would be subject to MISA sampling, analytical, quality analysis/quality control and flow measurement requirements.

Net loadings will be used to assess compliance for non-contact cooling water to which no treatment chemicals have been added. Non-contact cooling waters to which treatment chemicals have been added will be considered to be process effluents.

Toxicity

One means of testing the level of toxicity in effluents is to measure how short-term exposure to contaminants affects certain species. All direct dischargers will be required to monitor effluents for short-term lethality to trout and to Daphnia magna (water flea), according to testing procedures commonly used by the ministry.

"Effluent" can refer to process waste streams, cooling water (that is used only once for that purpose) and stormwater runoff. Toxicity limits will be developed for all effluents.

All effluent samples taken for testing will be taken at the "end-of-pipe". ("End of pipe" is defined as a location in an effluent stream situated before the discharge meets the surface watercourse, after any available treatment, and upstream of any significant contaminant masking or significant dilution with any other type of effluent).

Samples must pass a compliance criterion for short-term lethality to trout and to Daphnia magna. The criterion for both tests is 50 per cent survival after exposure for 96 hours to 100 per cent effluent.

Dischargers will initially monitor the toxicity of their effluents for at least one year. Monitoring regulation data can be used to meet this requirement. Until the one-year, non-acutely-lethal condition is met, the dischargers will be required to test samples monthly.

Enforcement actions can result if any sample fails either the trout test criteria or the Daphnia magna test criteria at any time.

For effluents that prove to be non-acutely lethal based on the one year of monitoring, testing can be decreased to a frequency of four times per year.

Less-than-lethal and long-term toxicity monitoring for assessment on fathead minnows and Ceriodaphnia (young water fleas) will be performed twice a year on discharges that are consistently non-acutely lethal. (This indicates the effect of toxics on succeeding generations.)

Flow Measurement Accuracy

All process effluent streams must be continuously monitored with an overall flow device accuracy of +/-15%. The ministry or the JTC can permit the continued use of existing flow measurement devices on process effluent streams which do not meet the accuracy requirements.

Non-contact cooling water, stormwater runoff, and any other effluent streams, will also be monitored with an overall accuracy of +/-15%.

Compliance

Compliance with the effluent limits regulation means that the discharger meets all the requirements of the regulation.

The types of samples and the frequency of monitoring activities required to assess compliance will be defined in the regulations. Self-monitoring by dischargers will be required. All actions carried out by dischargers to meet regulation requirements will be subject to ministry audit.

When a regulation is in place, plant limits based on a floating re-allocation of similar contaminants among streams will not be allowed. However, before the limits come into force, each discharger will have the opportunity to re-allocate contaminant loading limits among like streams at the same plant for the same contaminants -- provided that the overall regulatory loading limits assigned to that plant remain unchanged. After the limits come into force, re-allocation may be allowed, if it can be justified on the basis of an overall reduction of contaminant loadings.

All plants in a sector (or sub-sector) will be required to comply with all regulation requirements on the date regulation takes effect. The ministry will consider a means of allowing an extension beyond that period, if it can be demonstrated that there are unusual circumstances beyond discharger's control, such as unforeseen extensive engineering or construction delays due to factors, such as natural disasters, or for start-up of unproven new technology.

When effluent limits are exceeded, the excesses will be considered violations; they will be subject to ministry enforcement. The ministry enforcement policy will be clearly set out and applied consistently to all sectors.

Interim limits will not be imposed for the period between the date the regulations are decreed and the date the limits come into force. The ministry will continue to require an industry to conduct a self-monitoring control plan. Dischargers will be required to monitor effluents for limited parameters as required in ministry certificates of approval and control orders existing at that time.

Monitoring for Assessment

Quarterly monitoring will be required for all parameters which were selected but for which limits could not be set, for each process/effluent stream in a sector or sub-sector.

Where such parameters are unique to a particular site in a sector/sub-sector, quarterly monitoring only for those particular parameters can be specified on a site-specific basis, at the recommendation of the Sector JTC.

Semi-annual monitoring will be required for the full Effluent Monitoring Priority Pollutants List (EMPPL, a published list of contaminants) for each process effluent stream. Where semi-annual monitoring for the full EMPPL does not seem justified for simple or very small plants, the JTC may recommend that the ministry consider relaxing the requirements. This may mean reducing the frequency to once per year, or shortening the EMPPL, or both. (The ministry or the JTC can shorten EMPPL by excluding parameters which are not associated with the process operations of the sector or sub-sector.)

Semi-annual monitoring will be required for all new EMPPL compounds for all process effluent streams. Full EMPPL characterization will be required each time there is a significant change to the manufacturing or effluent treatment process, if it is expected to have an adverse impact on the quality of the process effluent. Open scan analyses must be undertaken as part of any EMPPL characterization.

Sublethal and chronic (long-term) toxicity monitoring for assessment will be performed on fathead minnows and Ceriodaphnia (young water fleas) twice each year on discharges that are consistently non-acutely lethal.

Stormwater

Most stormwater drainage systems direct stormwater and surface drainage towards natural receiving waters. While this protects property and life, it is widely known that these practices could degrade the quality of receiving waters and result in reducing or losing associated water uses (for example, swimming, fishing and outdoor recreation).

Under the effluent limits regulation, dischargers can be required to conduct a stormwater control study and take action to control stormwater, if the surface runoff from outdoor process areas (and from developed outdoor non-process areas) at a site exceeds the BAT limits for process effluents for that sector.

If required, dischargers will have six months to develop a stormwater control study plan and two years to implement the plan. Implementation of the remedial measures derived from the stormwater control study will not be part of the regulation. However, the implementation of these measures can be carried out using one of three options:

(1) issuing a control order;
(2) amending the effluent limits regulation; or,
(3) delaying implementation until the next regulation update.

If the quality of the stormwater at a site does not exceed the limits for process effluents in that sector, then the discharger can be required to continue monitoring stormwater for the purpose of assessment. The frequency of this monitoring will be determined on a site-by-site basis.

Monitoring for assessment requirements can be developed on a sector-wide basis to assist in the development of future stormwater limits; these requirements would be included in the effluent limits regulation for the sector.

By-Passes

By-passes are diversions of process or waste streams, cooling water (used once only), stormwater or surface runoff from any part of a facility, that results in the discharge of untreated (or inadequately treated) effluents to receiving waters.

By-passes are prohibited, unless:

- the by-pass was unavoidable to prevent loss of life, personal injury, or sever property damage, and was not caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operations

- no feasible, cost-effective alternatives to the by-pass exist, such as the use of auxiliary treatment facilities, retention of untreated or partially treated wastes, maintenance during normal periods of equipment downtime, or adequate backup equipment

- the stormwater, surface runoff, or infiltration event which caused the by-pass exceeded specified design capacity criteria set out in the effluent limits regulation

- the stormwater, surface runoff, infiltration, untreated or partially treated effluent did not exceed the effluent limitations for that stream and the by-pass was essential for maintenance to assure continued operations.

Capacity criteria (allowable volumes that would minimize bypasses) can be developed for controlling by-passes in a sector or sub-sector; this can be accomplished by utilizing sector specific standard codes of practice, design criteria, and/or regulatory practices from other jurisdictions. These capacity criteria, and the time the discharger will have to develop and implement any by-pass control requirements, will be included in the effluent limits regulation.

Reporting to the Public

The Ministry of the Environment has stated that: *"The public will have complete access to data on contaminant discharges to surface waters and on the effluent limits set for all dischargers. They will know which dischargers are in compliance, which dischargers have to implement further pollution abatement and the status of individual abatement programs".*

MISA reports must satisfy the public need for information; they must constitute meaningful, accurate and responsible reporting.

Information will be provided on the status of compliance of MISA dischargers against these regulations, as well as against programs to attain compliance.

Effluent data will be made public. "Effluent data" will be defined in the effluent limits regulation.

It is recognized that the confidentiality of some other information submitted in order to fulfil the requirements of the effluent limits regulations may, however, be unclear. When such is the case, and release of the information is requested, the request will be referred to the Commissioner of the Provincial Freedom of Information and Protection of Privacy Act for decision.

The MISA program does not require the various types of non-compliance (for example, technical violations, effluent limits exceedance, and the like), to be differentiated when reporting non-compliance. However, the ministry will attempt to differentiate between non-compliance involving consequences to the environment, from those types of non-compliance that do not affect the environment (for example, technical or procedural deviations).

Periodic Review

Regulation requirements will be reviewed every five years, with a view to establishing more stringent requirements.